

**Montana Board of Oil and Gas Conservation  
Environmental Assessment**

**Operator:** Continental Resources, Inc.  
**Well Name/Number:** Abernathy 1-16H  
**Location:** NE NW Section 16 T23N R52E  
**County:** Richland, **MT; Field (or Wildcat)** W/C (Bakken Horizontal)

**Air Quality**

(possible concerns)

Long drilling time: No, 15 to 25 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick rig to drill a single lateral horizontal Bakken Formation test, 13,745'MD/9,080'TVD.

Possible H<sub>2</sub>S gas production: Slight chance H<sub>2</sub>S gas from Mississippian Formations.

In/near Class I air quality area: No, no Class I air quality area nearby.

Air quality permit for flaring/venting (if productive): Yes, DEQ air quality permit required under 75-2-211.

Mitigation:

☒ Air quality permit (AQB review)

☐ Gas plants/pipelines available for sour gas

☐ Special equipment/procedures requirements

☐ Other: \_\_\_\_\_

Comments: No special concerns – using triple rig to drill a single lateral horizontal Bakken Formation test, 13,745'MD/9,080'TVD. If there is an existing gathering system for natural gas in the area, then associated gas can be gathered or if no gathering system nearby gas can be flared under Board Rule 36.22.1220.

**Water Quality**

(possible concerns)

Salt/oil based mud: Yes to intermediate casing string hole to be drilled with oil based invert drilling fluids (oil/water ratio of 70/30 to 80/20). Horizontal lateral will be drilled with brine water. Surface casing hole will use freshwater and freshwater mud system (Rule 36.22.1001).

High water table: No high water table anticipated at this location.

Surface drainage leads to live water: Yes, nearest drainage is an unnamed ephemeral tributary drainages to North Fork Lisk Creek, about 1/32 of a mile to the south from this location. A stock pond exists in this drainage, about 1/2 of a mile to the west from this location.

Water well contamination: None, closest water wells are about 5/8 of a mile to the southwest and about 3/4 of a mile to the north northwest from this location. Depth of these stock and domestic water wells range from 25' to 41'. Surface hole will be drilled with freshwater and freshwater mud system, Rule 36.22.1001. Surface casing will be set at 1390' and cemented to surface.

Porous/permeable soils: No, silty sandy clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

☐ Lined reserve pit

☒ Adequate surface casing

☐ Berms/dykes, re-routed drainage

☒ Closed mud system

☒ **Off-site disposal liquids (in approved facility)**  
☒ Other: Lined cuttings pit will be used since this is a closed loop mud system to be employed.

Comments: 1390' of surface casing enough to cover the base of the Fox Hills and cemented to surface adequate to protect freshwater zones, Rule 36.22.1001.

### Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No stream crossings anticipated.

High erosion potential: No high erosion potential, small cut and fill this location. The location will require a small cut, up to 7.9' and small fill, up to 7.2', required.

Loss of soil productivity: No, location will be restored after drilling if unproductive. If productive, unused portion of this drilling location will be restored.

Unusually large wellsite: No a large wellsite, 400'X450' location size required.

Damage to improvements: Slight, surface use is grazing land.

Conflict with existing land use/values: Slight

Mitigation

☐ Avoid improvements (topographic tolerance)

☐ Exception location requested

☒ Stockpile topsoil

☐ Stream Crossing Permit (other agency review)

☒ Reclaim unused part of wellsite if productive

☐ Special construction methods to enhance reclamation

☐ Other \_\_\_\_\_

Comments: Access will be over existing highway #308. About 1602' of new access road will be built into this location off the existing county road, #308. Cuttings will be buried in the lined cuttings pit. Oil based drilling fluids will be recycled. Reserve pit fluids will be hauled to a commercial disposal. Pit will be allowed to dry and then closed by filling in with clay subsoils. No special concerns.

### Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: No residences within a 1 mile radius from this location. The town of Richey, Montana is about 8 miles to the south from this location.

Possibility of H2S: Slight chance of H2S from Mississippian Formations.

Size of rig/length of drilling time: Triple drilling rig/short, 15 to 25 days drilling time.

Mitigation:

☒ Proper BOP equipment

☐ Topographic sound barriers

☐ H2S contingency and/or evacuation plan

☐ Special equipment/procedures requirements

☒ Other: Standard H2S safety equipment for the drilling of this well, rule 36.22.1014.

Comments: Adequate surface casing cemented to surface with an operational BOP stack (annular and double ram (pipe and blinds) rated for 5,000 psig) should mitigate any problems, Rule 36.22.1014.

### Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): Fox Lake State Game Management Area is about 18.7 miles to the southeast from this location.  
Proximity to recreation sites: Fox Lake State Game Management Area is about 18.7 miles to the southeast from this location.  
Creation of new access to wildlife habitat: No  
Conflict with game range/refuge management: No  
Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Least Tern, Whooping Crane and Piping Plover.  
Candidate specie is the Sprague's Pipit and the Greater Sage Grouse. NH tracker website indicate zero (0) species of concern in this township and range.

Mitigation:

- ☐ Avoidance (topographic tolerance/exception)
- ☒ Other agency review (DFWP, federal agencies BLM, **DNRC/TLMD**)
- ☐ Screening/fencing of pits, drillsite
- ☒ Other: State of Montana surface and minerals. TLMD will do surface EA.

Comments: State of Montana grazing surface lands. There may be species of concern that may be impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. No concerns.

### Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites: None identified.

Mitigation

- ☐ avoidance (topographic tolerance, location exception)
- ☒ other agency review (SHPO, **DNRC/TLMD**, federal agencies BLM)
- ☒ Other: State of Montana surface and minerals. TLMD will do surface EA.

Comments: State of Montana grazing surface lands. There may be possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite.

### Social/Economic

(possible concerns)

- ☐ Substantial effect on tax base
- ☐ Create demand for new governmental services
- ☐ Population increase or relocation

Comments: Wildcat well. No concerns.

### Remarks or Special Concerns for this site

Continental will drill a single lateral Bakken Formation horizontal well test, 13,745' MD/9,080' TVD. No special concerns.

### Summary: Evaluation of Impacts and Cumulative effects

No significant long term impacts expected, some short term impacts will occur.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/Steven Sasaki  
(title:) Chief Field Inspector  
Date: April 27, 2013

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website  
(Name and Agency)  
Water wells in Richland County  
(subject discussed)  
April 27, 2013  
(date)

US Fish and Wildlife, Region 6 website  
(Name and Agency)  
ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES  
MONTANA COUNTIES, Richland County  
(subject discussed)  
April 27, 2013  
(date)

Montana Natural Heritage Program Website  
(Name and Agency)  
Heritage State Rank= S1, S2, S3 T23N R52E  
(subject discussed)  
April 27, 2013  
(date)

Montana Cadastral Website  
(Name and Agency)  
Surface Ownership and surface use Section 16 T23N R52E  
(subject discussed)  
April 27, 2013  
(date)

DNRC TRUST LANDS Minerals website  
(Name and Agency)  
Mineral ownership is Section 16 T23N R52E  
(subject discussed)  
April 27, 2013  
(date)

If location was inspected before permit approval:  
Inspection date: \_\_\_\_\_  
Inspector: \_\_\_\_\_  
Others present during inspection: \_\_\_\_\_